

WHAT IS CLAIMED IS:

1. A permanent magnet electrical machine used as a motor or as a generator, comprising:

a movable member having a permanent magnet, and a stator having a coil which generates an alternating magnetic field to drive the movable member,

wherein the alternating magnetic field applies a repulsive force on the permanent magnet, the permanent magnet is divided into a plurality of sections in order to suppress the flow of an eddy current generated by high frequency components in the alternating magnetic field, and at least one of the sections of the permanent magnet has the shape and dimensions which are determined, taking account of the position dependence of the rate of change in the flux density applied to the permanent magnet during fixed-speed operation of the movable member.

2. The permanent magnet electrical machine as defined in Claim 1, wherein the permanent magnet is divided with the substantially flat faces which are substantially perpendicular to the direction of motion of the permanent magnet, the width of each section of the permanent magnet is set in response to the rate of change in the flux density at each position of the sections during fixed-speed operation.

3. The permanent magnet electrical machine as defined in Claim 2, wherein the width of each section of the permanent magnet is set to decrease as the rate of change in the flux density in that section increases.

4. The permanent magnet electrical machine as defined in Claim 2, wherein the width of each section of the permanent magnet is set so that eddy current loss in each section of the permanent magnet is substantially equal.

5. The permanent magnet electrical machine as defined in Claim 2, wherein the movable member is a rotating element, and the permanent magnet is divided into a plurality of sections along the direction of

rotation of the rotating element.

6. The permanent magnet electrical machine as defined in Claim 1, wherein the movable member is a rotating element, and the permanent magnet is divided into a plurality of sections with respect to the direction of rotation of the rotating element in order to suppress the flow of eddy current, the width of the section placed on the leading edge in the direction of rotation of the rotating element are more narrow than the width of other sections.

7. The permanent magnet electrical machine as defined in Claim 6, wherein the permanent magnet is divided into a plurality of portions in a radial direction of the rotating element, and at least the portion of the magnet nearest the stator is divided with respect to the direction of rotation of the rotating element.

8. The permanent magnet electrical machine as defined in Claim 1, wherein the movable member is a rotating element, and the permanent magnet is divided into a plurality of sections with respect to the direction of rotation of the rotating element, and the section of the permanent magnet positioned on the leading edge is of a width that increases towards the outer peripheral side of the rotating element in order to reduce the loop of eddy current.